



# **Investments in Commodity Futures**

## **Asset Allocation / Risk Management**

**March 13, 2006**

**Investment Committee Meeting**





# Background

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- A preview of investing in Commodity Futures was presented as a part of the Asset Allocation/Risk Management Annual Plan at the Investment Committee meeting on December 12, 2005
- Purpose of this agenda: Informational session on investing in Commodity Futures
- Investment recommendation will be presented at the Investment Committee meeting on April 17, 2006 regarding this pilot program



# Why Should CalPERS Invest in Commodity Futures?

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## ➤ **Inflation Hedge**

- Commodity futures perform well in an inflationary environment
- Unexpected inflation could affect funded ratios
- A higher correlation of the Fund to inflation is better for asset-liability matching

## ➤ **Fund Diversification**

- Commodity futures diversify the Fund exposure to equity risk
- Commodity futures' negative correlation to stocks and bonds helps to diversify the Fund
- Investments in commodity futures reduces Fund risk with minimal impact on return

## ➤ **Long Term Favorable Outlook on Commodity Returns**

- Commodity futures returns are expected to continue to be favorable
- Energy is the largest component in most commodity indices
- Total return commodity futures indices have two sources of return
- Commodity futures markets have ample market size to support a CalPERS investment

# Commodity Futures Perform Well in an Inflationary Environment

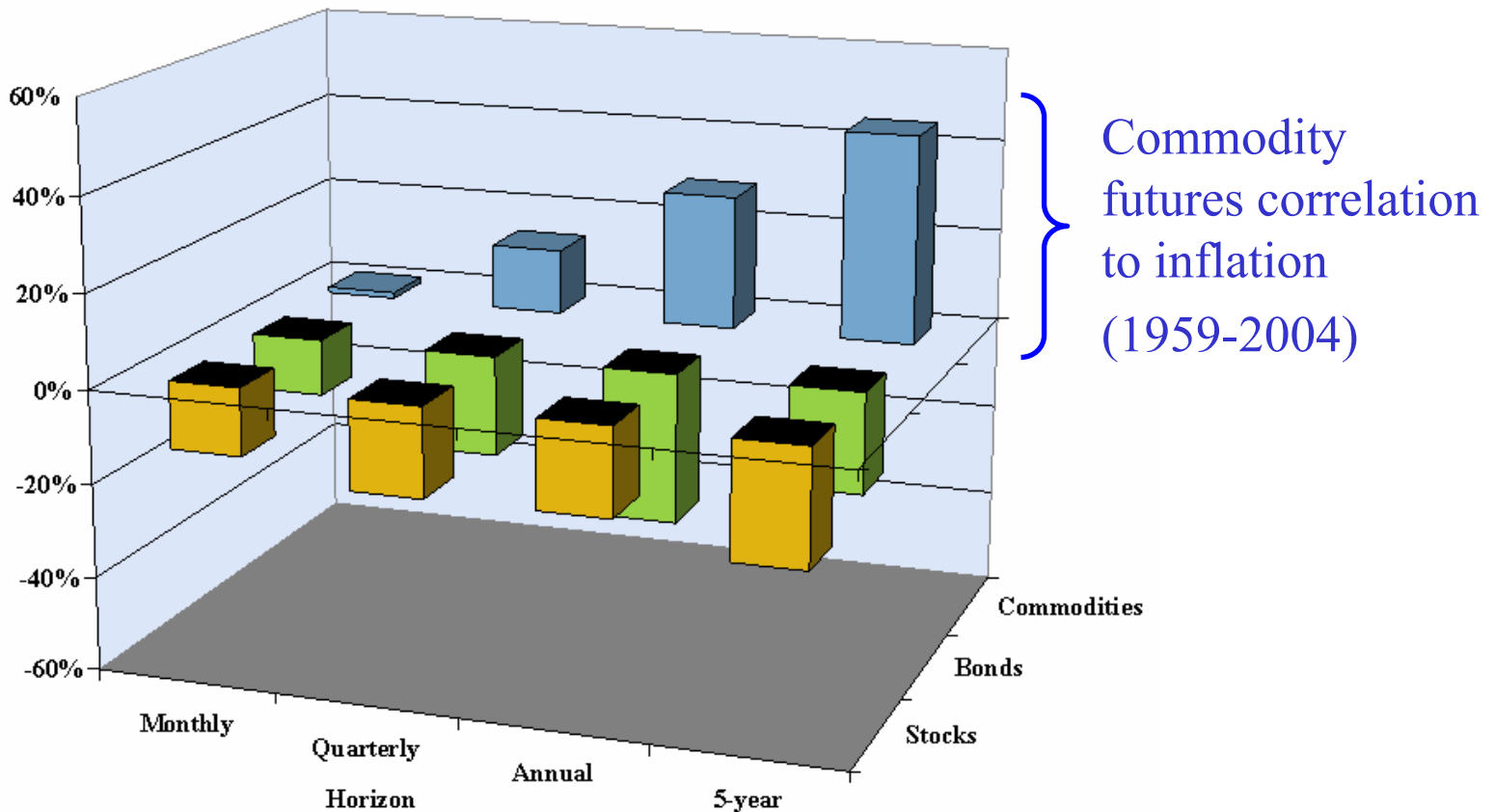
Rolling Quarterly Returns from Monthly Data, 1988-2005

	PERF	GSCI	DJ-AIG	S&P 500	REIT	LB Agg	CPI
CalPERS Fund	1.00						
Goldman Sachs Commodity Index	-0.19	1.00					
Dow Jones - AIG Commodity Index	-0.17	0.91	1.00				
S&P 500 Index	0.94	-0.23	-0.21	1.00			
Real Estate Investment Trust	0.47	-0.06	-0.05	0.42	1.00		
Lehman Brothers Aggregate Bond Index	0.12	-0.12	-0.19	0.02	0.16	1.00	
CPI	-0.21	0.46	0.40	-0.22	-0.21	-0.06	1.00

**Commodity Future  
Indices have exhibited a  
positive correlation to  
inflation...**

...while the CalPERS Fund,  
stocks, and bonds have exhibited  
negative correlations to inflation.

# Commodity Futures Correlation to Inflation Remains Positive Over Long Periods\*



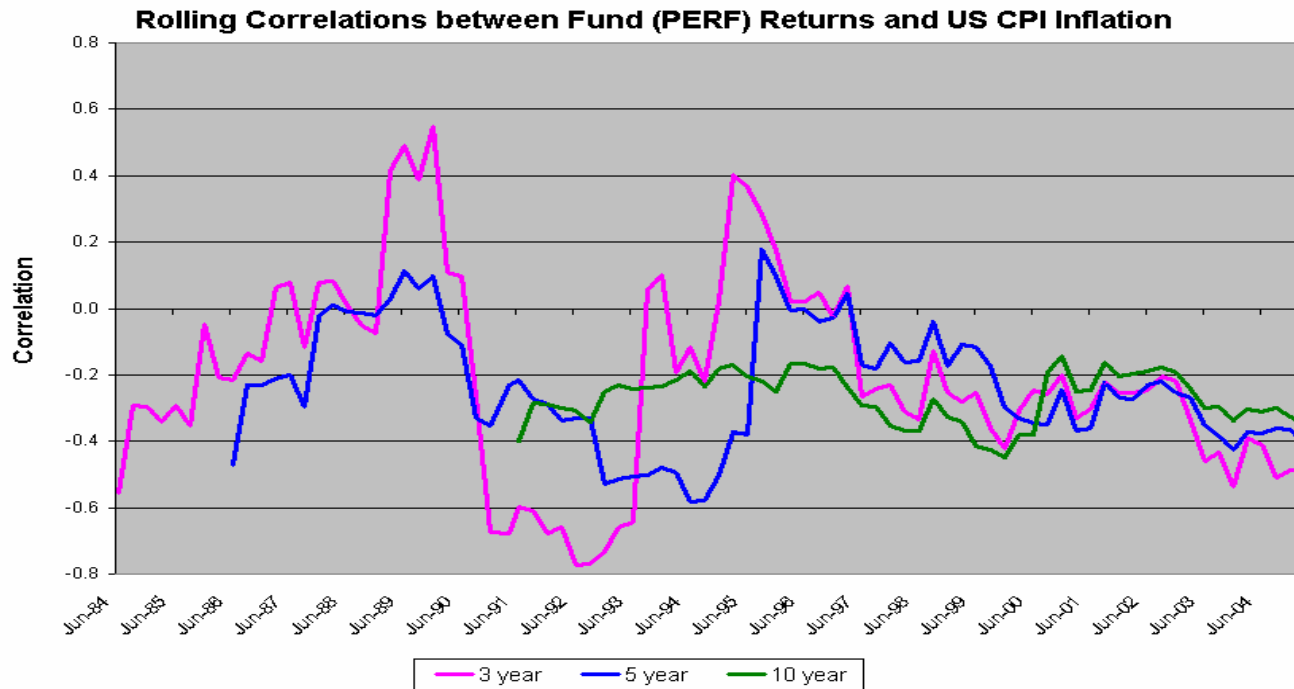
\*Equally-weighted collateralized futures index, Ibbotson Large Company Stocks and Long-Term Corporate Bond Indices, CPI-U. Data from July 1959 to December 2004. Source: Gorton and Rouwenhurst (2005)

# Unexpected Inflation Could Affect Funded Ratios



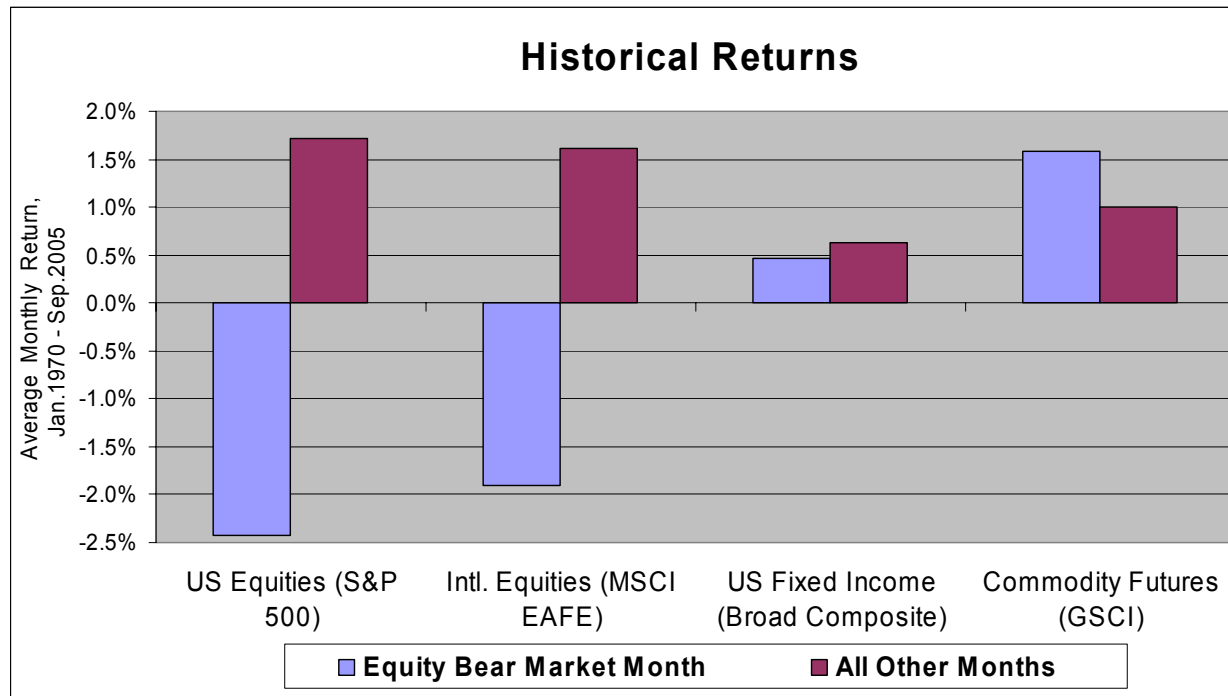
- Unexpected inflation could create a larger mismatch between assets and liabilities
- Possible sources of unexpected inflation
  - Monetary policy
  - Supply shocks

# A Higher Correlation of the Fund to Inflation is Better for Asset-Liability Matching



- Fund returns have moved counter to inflation over most years.
- The Fund's negative correlation to inflation reflects the historically equity-centric nature of Fund assets.
- Liability growth has been positively correlated with inflation.

# Commodities Futures Diversify the Fund Exposure to Equity Risk



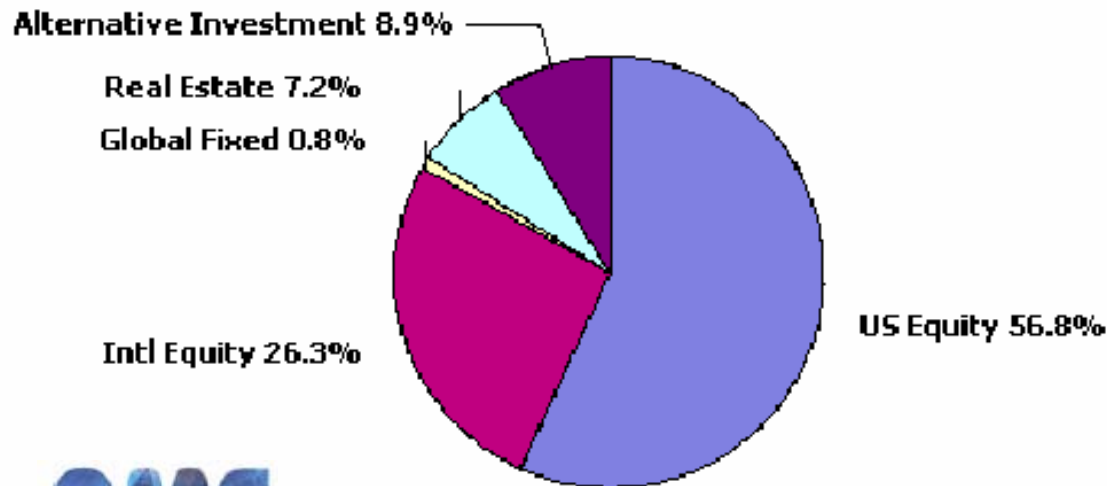
- When US equities experienced cumulative losses exceeding 25%, commodity futures returns were strongly positive.



# CalPERS Fund has Exposure to Equity Risk

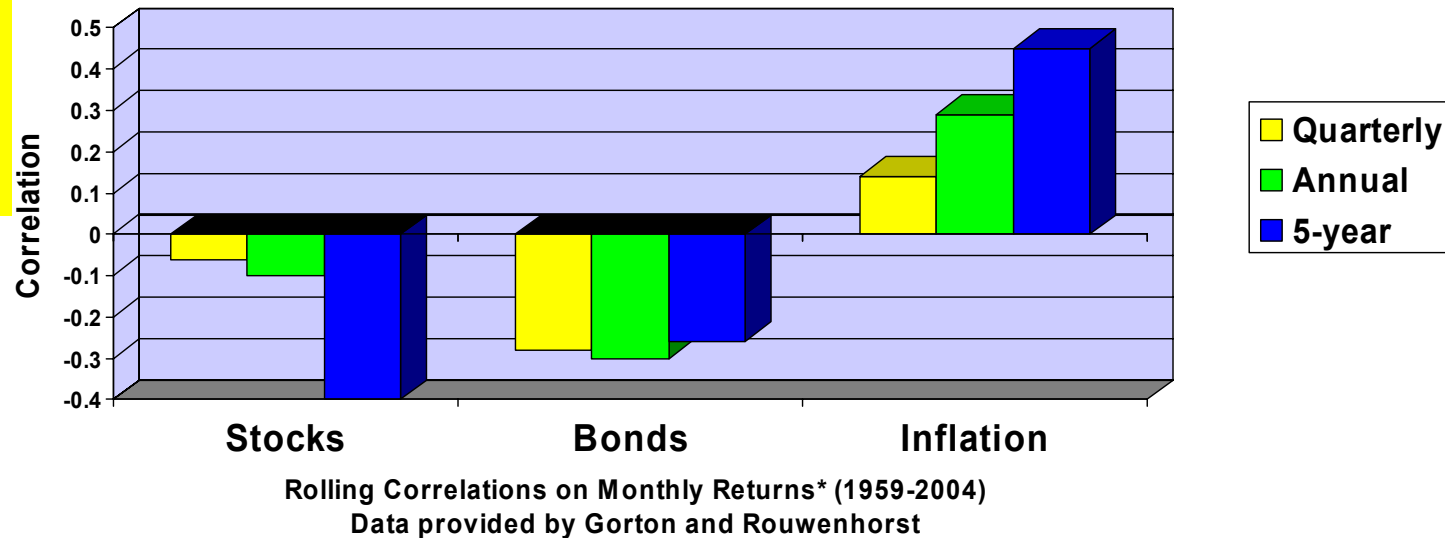
- Global Equity accounts for 92% of forecasted total CalPERS Fund risk.

**Contribution to Forecasted Total Risk**



Data as of 12/31/2005

# Commodity Futures Negative Correlation to Stocks and Bonds Helps to Diversify the Fund

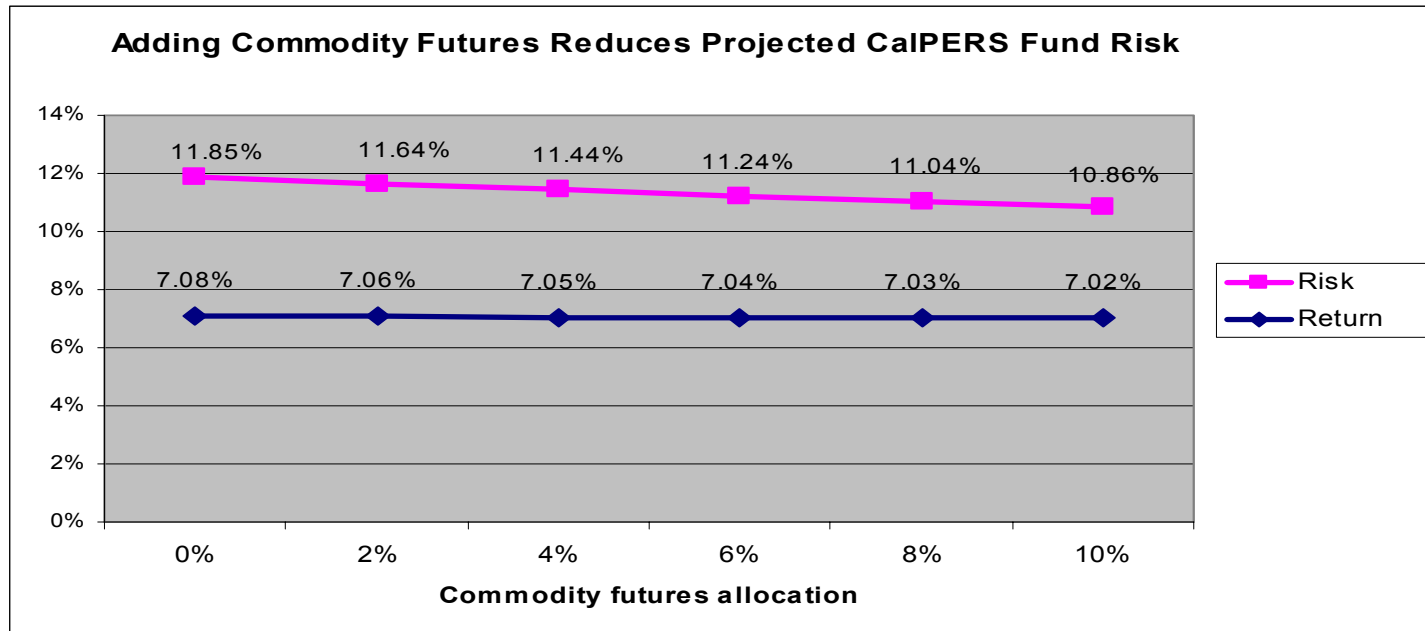


- Positive correlation with inflation rates
- Negative correlation with stocks and bonds

\*Equally-weighted collateralized futures index, Ibbotson Large Company Stocks and Long-Term Corporate Bond Indices, CPI-U. Data from July 1959 to December 2004. Source: Gorton and Rouwenhorst (2005)

# Investments in Commodity Futures

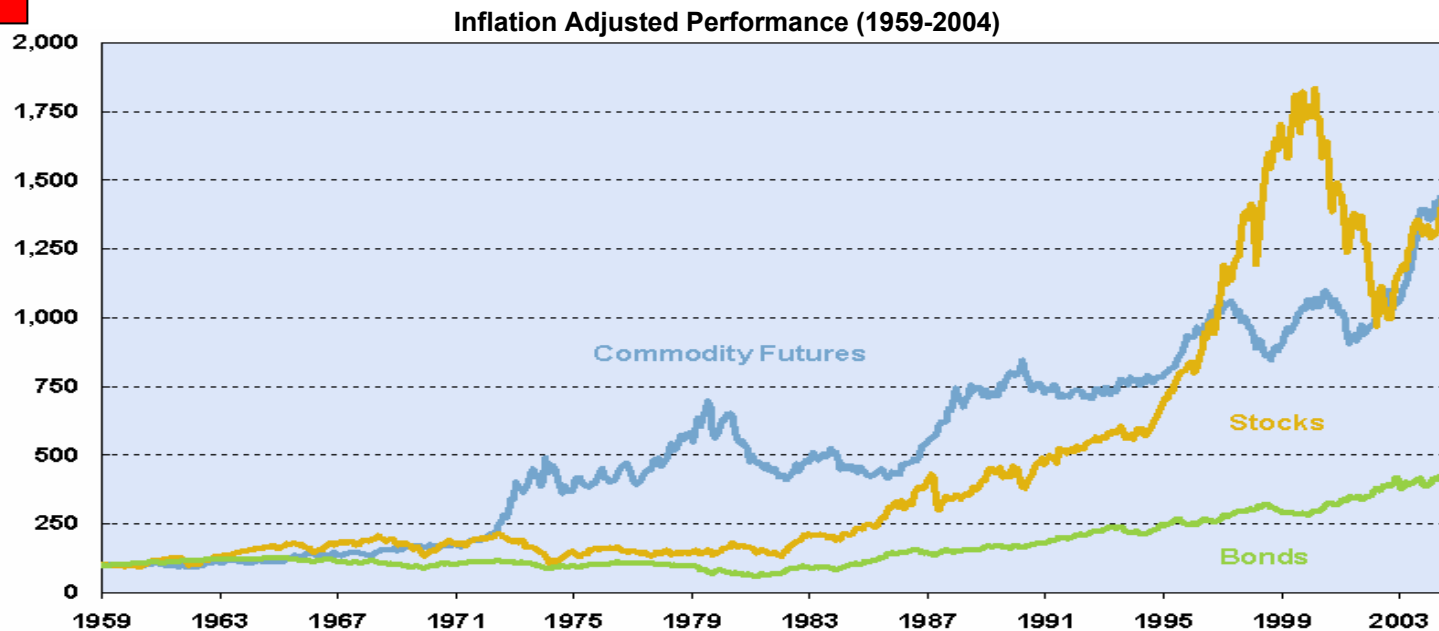
## Reduce Fund Risk with Minimal Impact on Return



Asset	Original Fund Asset Holdings	Expected Return	Expected Risk
US Equity	46%	8.00%	17.00%
International Equity	20%	8.00%	19.00%
Fixed	26%	4.75%	5.00%
Real Estate	8%	7.00%	16.00%
Commodity Futures	0%	6.50%	12.00%

Asset Class Assumptions Source: Wilshire (except CF return)

# Commodity Futures Returns have been Favorable and ....



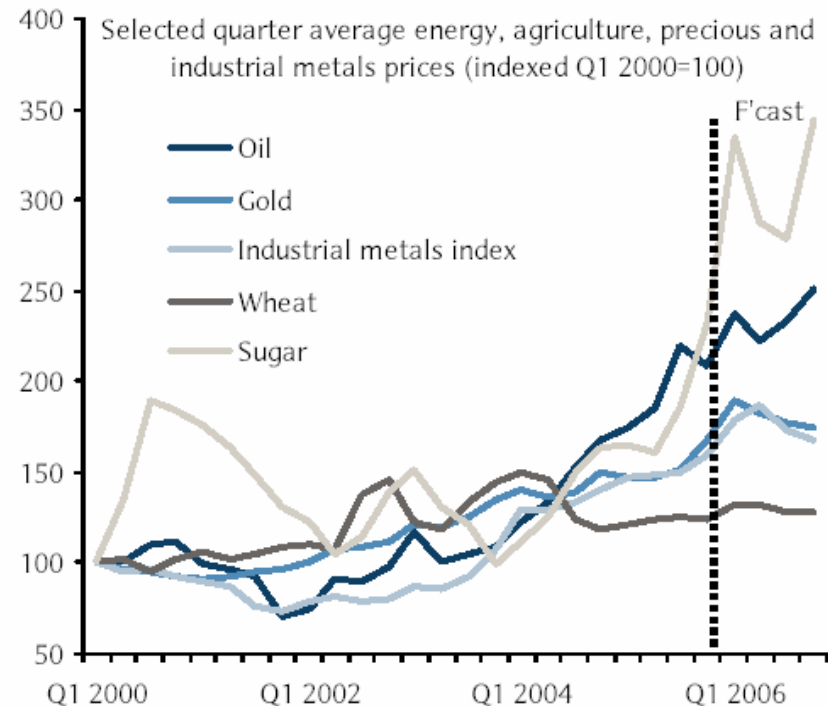
- Historically, returns of commodity futures\*
  - Compare favorably with those of traditional asset classes
  - Have been volatile

\*Equally-weighted collateralized futures index, Ibbotson Large Company Stocks and Long-Term Corporate Bond Indices, CPI-U. Data from July 1959 to December 2004. Source: Gorton and Rouwenhurst (2005)

# ... and are Expected to Continue to be Favorable

- Commodities usage rising globally
- Global tensions threaten supply chain
- Limited ability to substitute other materials in sectors where availability is scarce
- Much of the new supply is higher cost
- **Summary: Positive outlook for returns with significant volatility.**

Historical and forecast price trends in selected commodity markets

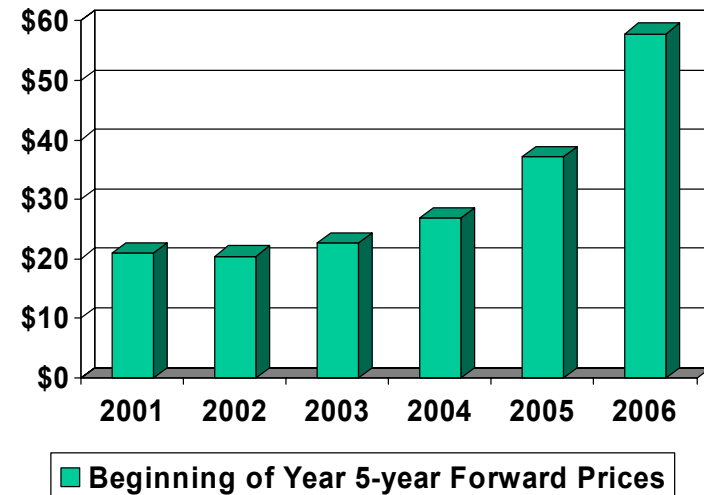


Changes are derived from average price levels in Q4 of each year. Figures for 2006 are BarCap forecasts. Source: EcoWin, Barclays Capital.

# Energy is the Largest Component in Most Commodity Indices

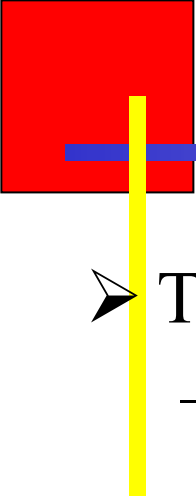
## ➤ Energy is the single best diversifier within commodities

- Highest correlation to inflation
- Largest source of historical commodity returns
- Current crude oil long-dated price moves are a part of a more fundamental change in the market.



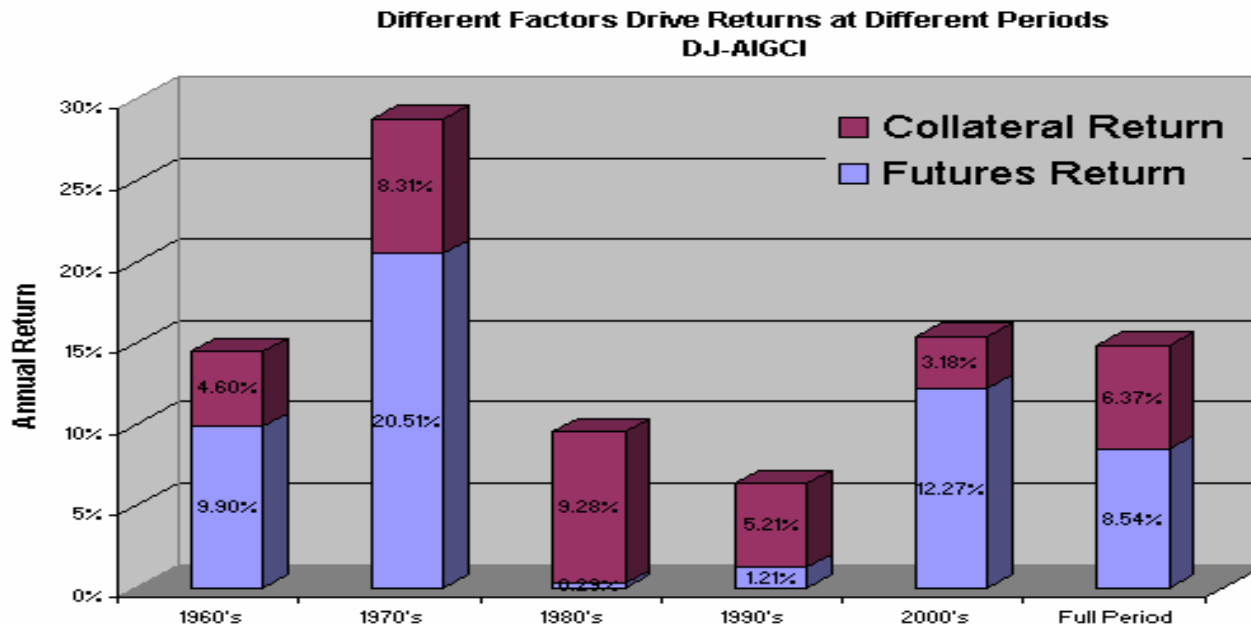
## ➤ Other commodities in an index help to dampen Energy volatility

# Understanding Commodity Futures Indices

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- Types of commodity futures index investments
    - Excess Return Index
      - return on futures contract rolls
    - Total Return Index
      - return on futures contract rolls
      - *plus* return on equivalent investment in Treasury Bills

# Total Return Commodity Futures Indices

## Drivers of Return – Collateral and Futures



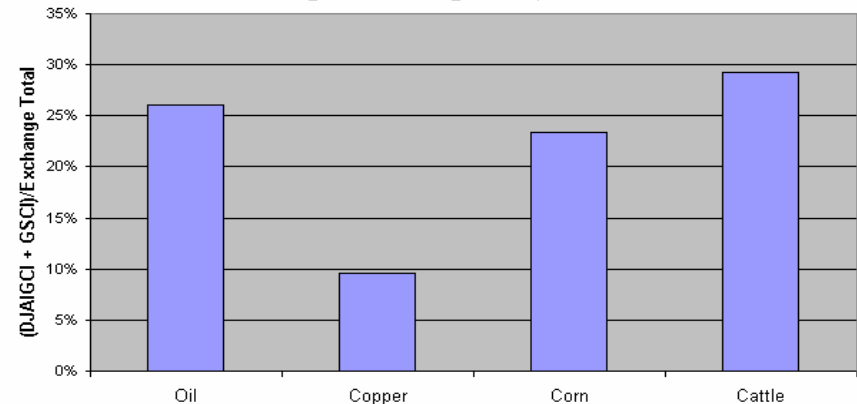
- During the inflationary 1960's and 1970's futures returns dominated.
- During the disinflation in the 1980's and 1990's collateral returns dominated and commodity futures performance was poor.
- During the growing commodity demands of the 2000's futures returns have dominated.



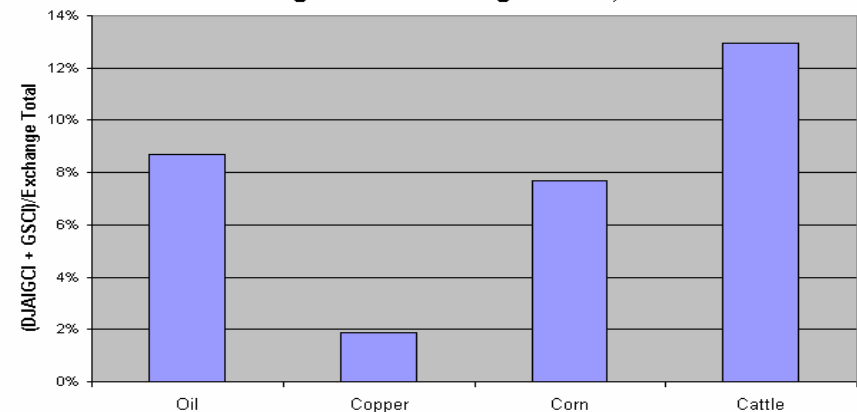
# Commodity Futures Markets Have Ample Capacity to support a CalPERS Investment

- Commodity futures indices represent ~\$80B of the ~\$350B of open interest in commodity futures
- Commodity index investments represent a small fraction of total traded volume
- Many firms trade futures and serve as counterparties for over-the-counter instruments

Commodity Futures Index Investment Open Interest as a Percentage of Exchange Total, 12/31/2005



Commodity Futures Index Investment Traded Volume as a Percentage of Total Exchange Volume, 2005





# Summary

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- A diversified collateralized commodities futures index provides
  - Inflation hedge
  - Fund diversification
  - Long term positive return outlook
- Volatility affects returns both on the upside as well as the downside



# Next Steps

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- Risk Management staff will work with Global Fixed Income staff and Wilshire regarding implementation issues
- Staff will return in April to seek Investment Committee approval
- Staff will submit appropriate Policy to Policy Subcommittee